

### REMARKS/ARGUMENTS

Claims 25-45 remain pending in this application. The examiner has acknowledged that claims 39-41 would be allowable if rewritten in independent form.

#### **I. § 103 Rejections**

Applicant submits that claims 25-45 are not obvious over U.S. Patent No. 5,741,085 to Wirtgen (Wirtgen) in view of U.S. Patent No. 4,532,271 to Kai et al. (Kai) and U.S. Patent No. 6,203,606 to Bond et al. (Bond) and U.S. Patent No. 4,839,404 to Chang et al. (Chang). Still further, these claims are not obvious even if the references mentioned above are combined with U.S. Patent No. 5,284,509 to Kamel et al. (Kamel) and/or U.S. Patent No. 6,440,205 to Bailey et al. (Bailey) and/or U.S. Patent No. 5,114,483 to Graf (Graf). Without using Applicants invention as a template, there is no teaching or suggestion by the cited references to combine these references so as to suggest Applicant's invention.

Using performance testing on a proposed asphalt emulsion mixture to select an asphalt emulsion mixture to be used for reconstructing a paved road using reclaimed asphalt pavement particles is not disclosed or suggested by the cited references even if these references are combined. None of the cited references discloses or suggests selecting an asphalt emulsion mixture to be used for reconstructing a paved road **after testing a proposed asphalt emulsion mixture** for performance.

While Kai discloses performing a raveling test, this test is proposed in an entirely different context from how a raveling test is used in Applicant's invention. First, Kai does not disclose or suggest reconstructing a paved road using reclaimed asphalt pavement particles, as claimed by Applicant. Accordingly, Kai does not teach how to choose asphalt compatible with reclaimed asphalt pavement particles.

Second, Kai does not disclose or suggest creating an asphalt emulsion mixture, as claimed by Applicant. While Kai mentions that the phenolic resin that is used to cover the aggregate could be an aqueous emulsion, this in no way suggests that the bituminous material and aggregate mixture taught by Kai is an emulsion.

Third, Kai does not disclose or suggest using a performance test, such as a raveling test, as part of a design process for selecting a desirable paving mixture, as claimed by Applicant. Applicant uses a raveling test to test a proposed asphalt emulsion mixture before selecting an asphalt emulsion mixture that is compatible with reclaimed asphalt pavement particles. In contrast, Kai merely uses a raveling test to confirm that his invented phenolic resin-coated aggregate mixed with asphalt provides superior raveling resistance compared with conventional asphalt aggregate mixtures.

The focus of Kai is on coating aggregate with a molten phenolic resin and then mixing the resin-coated aggregate with asphalt. Raveling testing is performed merely to verify that the phenolic resin coating provides asphaltic paving material with better raveling qualities than conventional asphalt mixed with aggregate. As described in Example 9 of Kai, “[t]he above-prepared paving material . . . was used in actual paving of a road and test specimens were taken from the pavement by cutting of which the wheel tracking test and raveling test were undertaken . . . .” As explained in this example, raveling testing only is being used to test specimens taken from an actual paved road. Kai does not disclose or suggest a design procedure that involves **testing a proposed asphalt mixture for raveling performance before selecting the mixture to be used for paving a road**, as claimed by Applicant.

Bond also does not disclose or suggest performance testing as a design technique for selecting an asphalt emulsion mixture to be used for reconstructing a paved road from reclaimed asphalt pavement particles.

First, Bond does not disclose or suggest reconstructing a paved road using reclaimed asphalt pavement particles, as claimed by Applicant. Accordingly, Bond does not teach how to choose asphalt compatible with reclaimed asphalt pavement particles.

Second, Bond does not disclose or suggest creating an asphalt emulsion mixture, as claimed by Applicant. In fact, Bond does not teach or suggest use of an emulsion.

Third, Bond does not disclose or suggest using a performance test, such as a moisture susceptibility test, as part of a design process for selecting a desirable paving mixture, as claimed by Applicant. Applicant uses a moisture susceptibility test to test a proposed asphalt emulsion mixture before selecting an asphalt emulsion mixture that is compatible with reclaimed asphalt pavement particles. In contrast, Bond merely mentions in his background section that moisture susceptibility tests have been performed.

More specifically, Bond discusses in his background section that traditionally the critical specification of asphalt cement was its viscosity but that other specifications including "penetration, ductility, softening point and moisture susceptibility" might also be tested. See col. 1, lines 20-32. Then, Bond goes on to point out that there was a need to modify asphalt specifications conducted in this manner. See col. 1, lines 33-38. According to Bond, the tests listed above were modified and new tests were developed in favor of performance grade asphalt testing, which artificially ages the asphalt to determine how the material can be expected to perform on the road surface during a several year period. Thus, Bond teaches away from moisture susceptibility testing and instead teaches toward performance grade asphalt testing.

Bond's invention relates to an improved method for producing performance grade asphalt from asphalt cement, aggregates and reclaimed used lubricating oil. Bond's mention of moisture susceptibility testing in no way discloses or suggests using such a test as part of a design technique for testing a proposed asphalt mixture before selecting an asphalt mixture to be used in reconstructing a paved road.

Chang also does not disclose or suggest performance testing as a design technique for selecting an asphalt emulsion mixture to be used for reconstructing a paved road from reclaimed asphalt pavement particles. First, Chang does not disclose or suggest reconstructing a paved road using reclaimed asphalt pavement particles, as claimed by Applicant. Accordingly, Chang does not teach how to choose asphalt compatible with reclaimed asphalt pavement particles.

Second, Chang does not disclose or suggest creating an asphalt emulsion mixture, as claimed by Applicant. Chang's bituminous material used in the practice of his invention is not an emulsion.

Third, Chang does not disclose or suggest using a performance test, such as a moisture susceptibility test, as part of a design process for selecting a desirable paving mixture, as claimed by Applicant. Applicant uses a moisture susceptibility test to test a proposed asphalt emulsion mixture before selecting an asphalt emulsion mixture that is compatible with reclaimed asphalt pavement particles. In contrast, Chang merely uses a moisture susceptibility test to confirm the properties of his invented asphalt mixture containing  $\alpha$ -olefin copolymers.

More specifically, Chang discloses improving the adhesion of aggregate and bitumen by incorporating small amounts of certain  $\alpha$ -olefin copolymers into an asphalt mixture. This asphalt mixture is not an emulsion, and Chang does not teach or suggest use of an emulsion. Chang merely uses a moisture susceptibility test to confirm that his invented asphalt mixture containing

$\alpha$ -olefin copolymers provides superior adhesion compared with mixtures that do not contain  $\alpha$ -olefin copolymers.

The above three references, Kai, Bond, and Chang, have been combined with Wirtgen in an attempt to disclose or suggest the raveling and moisture susceptibility tests claimed by Applicant that admittedly are not taught or suggested by Wirtgen. In fact, Wirtgen not only does not suggest these particular tests but also does not disclose or suggest using performance tests as part of the process of selecting an asphalt emulsion mixture for reconstructing a paved road. The "sampling and analysis" discussed in Wirtgen at col. 2, line 40, and col. 4, line 64, does not teach or suggest performance testing of proposed asphalt emulsion mixtures, as claimed by Applicant. In contrast, it only involves sampling and analysis of the existing road surface to be repaired.

Wirtgen does not disclose or suggest forming a proposed asphalt emulsion mixture from an emulsion and reclaimed asphalt pavement particles and testing this proposed asphalt emulsion mixture for performance, as claimed by Applicant. Still further, Wirtgen does not disclose or suggest selecting an asphalt emulsion mixture to be used for reconstructing a paved road after testing the proposed asphalt emulsion mixture for performance, as also claimed by Applicant.

Kai, Bond, and Chang are not properly combinable with Wirtgen because these references do not even involve using reclaimed asphalt pavement particles to reconstruct a paved road. Further, these references are not properly combinable with Wirtgen because they do not relate to using asphalt emulsion mixtures that are emulsions. One looking to improve the asphalt emulsion mixture of Wirtgen or looking to use reclaimed asphalt pavement particles to reconstruct a paved road would have no motivation to look to Kai, Bond, and/or Chang, as these references provide no teachings in these areas.

Even if Kai, Bond, and Chang are combined with Wirtgen, a method of selecting an asphalt emulsion mixture that includes testing a proposed asphalt emulsion mixture for performance before selecting an asphalt emulsion mixture for reconstructing a paved road is not suggested. None of these cited references discloses or suggests testing a proposed asphalt emulsion mixture for performance and selecting an asphalt emulsion mixture to be used for reconstructing a paved road after testing said proposed asphalt emulsion mixture. These are both key elements of Applicant's claimed invention that are not suggested by any of the cited references. Still further, none of these references suggests the desirability of using a raveling test in combination with a moisture susceptibility test to test performance, as claimed by Applicant. For the foregoing reasons, a *prima facie* case of obvious for rejecting the pending claims has not be established.

Turning specifically to claims 25-26, 33-38, and 42-45, the combination of Wirtgen, Kai, Bond, and Chang does not disclose or suggest several elements of these claims including (1) testing a proposed asphalt emulsion mixture made from an emulsion and reclaimed asphalt pavement particles for performance and (2) selecting an asphalt emulsion mixture to be used for reconstructing a paved road after testing the proposed asphalt emulsion mixture for performance. It is not enough to supply Kai, Bond, and Chang for teaching that raveling tests and moisture susceptibility tests have been performed because none of these cited references discloses or suggests performance testing a proposed asphalt mixture before the mixture to be used for paving is selected. Further, none of these cited references discloses or suggests the desirability of using a raveling test in combination with a moisture susceptibility test when performance testing. While Kai mentions performing a stability test, he does not suggest performing a stability test on a proposed asphalt mixture and selecting an asphalt emulsion mixture to be used for



reconstructing a paved road after performing that test, as claimed by Applicant in claim 26. Further, by performance testing a proposed asphalt emulsion mixture made from an emulsion and reclaimed asphalt pavement particles from the area to be reconstructed, as claimed in claim 34, this information can help to better select an asphalt mixture that is compatible with the particular area of the road than the design techniques taught by the cited references.

Graf merely is cited for disclosing use of a cationic emulsifier. Kai, Bond, Chang, Kamel, and Bailey are not combinable with Graf for the same reasons they are not combinable with Wirtgen. Wirtgen and Graf teach the making of asphalt emulsion mixtures whereas the other cited references do not teach the making of asphalt emulsion mixtures. However, even though Wirtgen and Graf both teach asphalt emulsion mixtures, these references are not properly combinable because there is no teaching or suggestion that Graf's asphalt emulsion composition would be appropriate for being mixed with reclaimed asphalt pavement particles to form an asphalt emulsion mixture for reconstructing a road, as done by Wirtgen. In addition to the foregoing reasons, because Graf is not properly combinable with Wirtgen, a *prima facie* case of obviousness for rejecting claim 33 has not been established.

As to claims 42-45, in addition to the reasons discussed above, claims 42-45 are not obvious in view of the cited references because the combination of cited references does not suggest (1) testing a proposed asphalt emulsion mixture made from an emulsion and reclaimed asphalt pavement particles for performance, (2) selecting an asphalt emulsion mixture to be used for reconstructing a paved road after testing the proposed asphalt emulsion mixture for performance, (3) preparing the selected asphalt emulsion mixture by mixing reclaimed asphalt pavement particles from the road to be reconstructed with an emulsion so as to form the selected

asphalt emulsion mixture, and (4) applying this selected asphalt emulsion mixture to the reclaimed road so as to form a cold in-place recycling layer on the road.

Kamel is cited for disclosing a resilient modulus test, but this test is used in an entirely different context from how a resilient modulus test is used in Applicant's claimed invention, namely claims 28 and 30. Further, Kamel cannot be used to suggest the more general modulus testing that Applicant is claiming in claims 27 and 29.

First, Kamel does not disclose or suggest reconstructing a paved road using reclaimed asphalt pavement particles, as claimed by Applicant. Accordingly, Kamel does not teach how to choose asphalt compatible with reclaimed asphalt pavement particles.

Second, Kamel does not disclose or suggest creating an asphalt emulsion mixture, as claimed by Applicant. In fact, Kamel does not teach or suggest use of an emulsion mixture. For the foregoing reasons, Kamel is not properly combinable with Wirtgen.

Third, Kamel does not disclose or suggest using a performance test, such as a resilient modulus test, as part of a design process for selecting a desirable paving mixture, as claimed by Applicant. Applicant uses a modulus test, as claimed in claims 27 and 29, or specifically a resilient modulus test, as claimed in claims 28 and 30, to test a proposed asphalt emulsion mixture before selecting an asphalt emulsion that is compatible with reclaimed asphalt pavement particles. In contrast, Kamel merely performs a resilient modulus test to confirm the properties of a newly paved road, as shown in Table 18 at col. 20.

Accordingly, even if Kamel is combined with Wirtgen and the other cited references, claims 27-30 are not obvious for the same reasons explained above. Further, these claims are not obvious because, even with the addition of Kamel, the combination of cited references fails to



suggest using a modulus test or a resilient modulus test, in particular, to test a proposed asphalt mixture before selecting an asphalt emulsion mixture to be used for reconstructing a paved road.

Bailey is cited for disclosing a thermal cracking test, but this test is used in an entirely different context from how a thermal cracking test is used in Applicant's invention, as claimed by Applicant in claims 31 and 32.

First, Bailey does not disclose or suggest reconstructing a paved road using reclaimed asphalt pavement particles, as claimed by Applicant. Accordingly, Bailey does not teach how to choose asphalt compatible with reclaimed asphalt pavement particles.

Second, Bailey does not disclose or suggest creating an asphalt emulsion mixture, as claimed by Applicant. In fact, Bailey does not teach or suggest use of an emulsion mixture, as claimed by Applicant. For the foregoing reasons, Bailey is not properly combinable with Wirtgen.

Third, Bailey does not disclose or suggest using a performance test, such as a thermal cracking test, as part of a design process for selecting a desirable paving mixture, as claimed by Applicant in claims 31 and 32. Applicant uses a thermal cracking test, as claimed in claims 31 and 32, to test a proposed asphalt emulsion mixture before selecting an asphalt emulsion that is compatible with reclaimed asphalt pavement particles. In contrast, Bailey merely uses a thermal cracking test to show that his invented paving binder confers good thermal cracking resistance to pavement in a low-temperature zone.

Accordingly, even if Bailey is combined with Wirtgen and the other cited references, claims 31-32 are not obvious for the same reasons explained above. Further, these claims are not obvious because, even with the addition of Bailey, the combination of cited references fails to

suggest using a thermal cracking test to test a proposed asphalt mixture before selecting an asphalt emulsion mixture to be used for reconstructing a paved road.

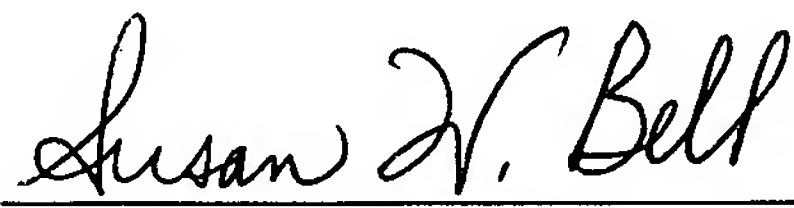
For the foregoing reasons, a *prima facie* case of obvious for rejecting claims 25-45 has not been established.

## II. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that claims 25-45 are in condition for allowance and eventual issuance. Such action is respectfully requested. Should the Examiner have any further questions or comments which need be addressed in order to obtain allowance, please contact the undersigned attorney at the number listed below.

Acknowledgement of receipt is respectfully requested.

Respectfully submitted,

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